CLAIMS

What is claimed is:

1. A method of assessing hematopoietic status in a subject, the method comprising:

   (a) providing a test cell population from the subject, wherein at least one cell in the test cell population is capable of expressing one or more nucleic acid sequences selected from the group consisting of HEMA 1-39 and 40;

   (b) measuring the expression of one or more of the nucleic acid sequences in said test cell population; and

   (c) comparing the expression of the nucleic acid sequences in the test cell population to the expression of the nucleic acid sequences in a reference cell population comprising at least one cell whose hematopoietic status is known,

   thereby indicating hematopoietic status in the subject.

2. The method of claim 1, wherein the method comprises comparing the expression of five or more of the nucleic acid sequences.

3 The method of claim 1, wherein the method comprises comparing the expression of 20 or more of the nucleic acid sequences.

4. The method of claim 1, wherein the method comprises comparing the expression of 25 or more of the nucleic acid sequences.

5. The method of claim 1, wherein the expression of the nucleic acid sequences in the test cell population is increased as compared to the reference cell population.

6. The method of claim 1, wherein the test cell population is provided *in vitro*.

7. The method of claim 1, wherein the test cell population is provided *ex vivo* from a mammalian subject.

8. The method of claim 1, wherein the test cell is provided *in vivo* in a mammalian subject.

9. The method of claim 1, wherein the test cell population is derived from a human or rodent subject.

10. The method of claim 1, wherein the test cell includes a hematopoietic cell.

11. A method of diagnosing or determining the susceptibility to a hematopoietic disorder in a subject, the method comprising:

(a) providing from the subject a test cell population comprising cells capable of expressing one or more nucleic acid sequences selected from the group consisting of HEMA 1-39 and 40;

(b) measuring expression of one or more of the nucleic acid sequences in the test cell population; and

(c) comparing the expression of the nucleic acid sequences in the test cell population to the expression of the nucleic acid sequences in a reference cell population comprising at least one cell from a subject not suffering from a hematopoietic disorder; and

(d) identifying a difference in expression levels of the nucleic acid sequences, if present, in the test cell population and reference cell population,

thereby diagnosing or determining the susceptibility to a hematopoietic disorder in the subject.

12. The method of claim 11, wherein the hematopoietic disorder is selected from the group consisting of anemia, leukemia and lymphoma.

13. A method of treating a hematopoietic disorder in a subject, the method comprising administering to the subject an agent that modulates the expression or the activity of one or more nucleic acids selected from the group consisting of HEMA 1-39 and 40

14. The method of claim 13, wherein the agent is a peptide, peptidomimetic, small molecule or other drug.

15. A method of assessing the efficacy of a treatment of a hematopoietic disorder in a subject, the method comprising:

(a) providing from the subject a test cell population comprising cells capable of expressing one or more nucleic acid sequences selected from the group consisting of HEMA 1-39 and 40;

(b) detecting expression of one or more of the nucleic acid sequences in the test cell population;

(c) comparing the expression of the nucleic acid sequences in the test cell population to the expression of the nucleic acid sequences in a reference cell population comprising at least one cell from a subject not suffering a hematopoietic disorder; and

(e) identifying a difference in expression levels of the nucleic acid sequences, if present, in the test cell population and reference cell population,

thereby assessing the efficacy of treatment of the hematopoietic disorder in the subject.

16. An isolated nucleic acid molecule encoding a polypeptide comprising an amino acid sequence that is at least 75% identical to SEQ ID NO: 2, 4, or 5 or the complement of the nucleic acid molecule.

17. A nucleic acid vector comprising the nucleic acid molecule of claim 16.

18. A host cell comprising the isolated nucleic acid molecule of claim 16.

19. An isolated polypeptide at least 80% identical to a polypeptide selected from the group consisting of:

a) a polypeptide comprising an amino acid sequence of SEQ. ID NO:2, 4 or 5;

b) a fragment of a polypeptide comprising an amino acid sequence of SEQ ID NO: 2, 4 or 5, wherein the fragment comprises at least 6 contiguous amino acids of SEQ ID NO: 2, 4 or 5;

c) a derivative of a polypeptide comprising an amino acid sequence of SEQ ID NO: 2, 4 or 5

d) an analog of a polypeptide comprising an amino acid sequence of SEQ ID NO: 2, 4 or 5; and

e) a homolog of a polypeptide comprising an amino acid sequence of SEQ ID NO: 2, 4 or 5;

20. An antibody that selectively binds to the polypeptide of claim 19, and fragments, homologs, analogs and derivatives of the antibody.

21. A pharmaceutical composition comprising the nucleic acid of claim 16.

22. A pharmaceutical composition comprising the polypeptide of claim 19.

23. A method of detecting the presence of the polypeptide of claim 19 in a sample, comprising contacting the sample with a compound that selectively binds to the polypeptide of claim 19 and determining whether the compound bound to the polypeptide of claim 19 is present in the sample.

24. A method for modulating the activity of the polypeptide of claim 19, the method comprising contacting a cell sample comprising the polypeptide of claim 19 with a compound that binds to said polypeptide in an amount sufficient to modulate the activity of the polypeptide.

25. A method of promoting migration of a hematopoietic stem cell, the method comprising contacting the hematopoietic stem cell with the polypeptide of claim 19 in an amount sufficient to promote migration of the hematopoietic stem cell.

26. The method of claim 25, wherein the hematopoietic stem cell is a bone marrow cell or a fetal liver cell.

27. A method of inhibiting proliferation or differentiation of a hematopoietic stem cell or a endothelial cell, the method comprising contacting the cell with the polypeptide of claim 19 in an amount sufficient to inhibit proliferation of the cell.

28. The method of claim 27, wherein the hematopoietic stem cell or the endothelial cell is provided *in vitro*.

28. The method of claim 27, wherein the hematopoietic stem cell or the endothelial cell is provided *ex vivo* from a mammalian subject.

30. The method of claim 27, wherein the hematopoietic stem cell or the endothelial cell is provided *in vivo* in a mammalian subject.

31. The method of claim 27, wherein the hematopoietic stem cell or the endothelial cell is derived from a human or rodent subject.

32. A method of identifying an agent that modulates hematopoiesis, the method comprising

(a) contacting the polypeptide of claim 19 and a test agent; and

(b) detecting a complex between the polypeptide the agent, wherein the presence of the complex indicates that the agent modulates hematopoiesis.

33. A method of identifying an agent that modulates hematopoiesis, the method comprising

(a) providing a hematopoietic stem cell;

(b) contacting the hematopoietic stem cell with the polypeptide of claim 19 and a test agent; and

(c) comparing the proliferation of the hematopoietic stem cell in the presence of the polypeptide and the test agent to the proliferation of the hematopoietic stem cell in the absence of the test agent,

wherein an alteration in the proliferation or differentiation of the hematopoietic stem cell in the presence of the test agent compared to the proliferation or differentiation of the hematopoietic stem cell in the absence of the test agent indicates the test agent modulates hematopoiesis.

34. A chimeric polypeptide comprising a first domain and a second domain linked by a covalent bond, the first domain comprising a chemokine, and the second domain comprising a hematopoietic modulating sequence.

35 The polypeptide of claim 34, wherein the chemokine is a CXC or CC chemokine.

36. The polypeptide of claim 34, wherein the hematopoietic modulating sequence comprises the amino acid sequence of SEQ ID NO: 6.

37. An isolated nucleic acid molecule encoding a polypeptide of claim 34.

38. A nucleic acid vector comprising the nucleic acid molecule of claim 37.

39. A host cell comprising the isolated nucleic acid molecule of claim 37.

40. A pharmaceutical composition comprising the nucleic acid of claim 37.

41. An antibody that selectively binds to the polypeptide of claim 34, and fragments, homologs, analogs and derivatives of the antibody.

42. A pharmaceutical composition comprising the polypeptide of claim 34.

43. A method of detecting the presence of the polypeptide of claim 34 in a sample, comprising contacting the sample with a compound that selectively binds to the

polypeptide of claim 32 and determining whether the compound bound to the polypeptide of claim 32 is present in the sample.

44. A method for modulating the activity of the polypeptide of claim 34, the method comprising contacting a cell sample comprising the polypeptide of claim 34 with a compound that binds to said polypeptide in an amount sufficient to modulate the activity of the polypeptide.

45. A method of promoting migration of a hematopoietic stem cell, the method comprising contacting the hematopoietic stem cell with the polypeptide of claim 34 in an amount sufficient to promote migration of the hematopoietic stem cell.

46. The method of claim 45, wherein the hematopoietic stem cell is a bone marrow cell or a fetal liver cell.

47. A method of inhibiting proliferation or differentiation of a hematopoietic stem cell or endothelial cell, the method comprising contacting the cell with the polypeptide of claim 32 in an amount sufficient to inhibit proliferation of the cell.

48. The method of claim 47, wherein the hematopoietic stem cell or endothelial cell is provided *in vitro*.

49. The method of claim 47, wherein the hematopoietic stem cell or endothelial cell is provided *ex vivo* from a mammalian subject.

50. The method of claim 47, wherein the hematopoietic stem cell or endothelial cell is provided *in vivo* in a mammalian subject.

51. The method of claim 47, wherein the hematopoietic stem cell is derived from a human or rodent subject.

52. A method of identifying an agent that modulates hematopoiesis, the method comprising

(a) contacting the polypeptide of claim 34 and a test agent; and

(b) detecting a complex between the polypeptide the agent, wherein the presence of the complex indicates that the agent modulates hematopoiesis.

53. A method of identifying an agent that modulates hematopoiesis, the method comprising

(a) providing a hematopoietic stem cell;

(b) contacting the hematopoietic stem cell with the polypeptide of claim 34 and a test agent; and

(c) comparing the proliferation or differentiation of the hematopoietic stem cell in the presence of the polypeptide and the test agent to the proliferation or differentiation of the hematopoietic stem cell in the absence of the test agent,

wherein an alteration in the proliferation or differentiation of the hematopoietic stem cell in the presence of the test agent compared to the proliferation or differentiation of the hematopoietic stem cell in the absence of the test agent indicates the test agent modulates hematopoiesis.

54. A kit which detects two or more of the nucleic acid sequences selected from the group consisting of HEMA 1-39 and 40.

55. An array which detects one or more of the nucleic acid selected from the group consisting of HEMA 1-39 and 40.

56. A plurality of nucleic acid comprising one or more of the nucleic acid selected from the group consisting of HEMA 1-39 and 40.

add c'

add a'